



## Office of Transportation Technologies

Working in partnership to develop clean and efficient vehicular technologies and fuel

ENERGY  
EFFICIENCY AND  
RENEWABLE  
ENERGY  
  
OFFICE OF  
TRANSPORTATION  
TECHNOLOGIES



# Transportation

## FOR THE 21ST CENTURY

The Office of Transportation Technologies (OTT) within the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy is working to reduce the use of petroleum fuels by highway transportation vehicles. OTT works in partnership with the domestic transportation and energy supply industries, and with research and development organizations to develop and promote acceptance of advanced transportation and alternative fuel technologies. Use of these technologies will lead to a decrease in oil use, greenhouse gas, and automobile exhaust emissions. OTT is also working to develop technologies that will help the domestic industries assure their place in the extremely competitive world market for transportation services.

OTT is divided into the following four offices:

- The Office of Advanced Automotive Technologies conducts research programs aimed at developing improved light vehicles, including hybrid electric vehicles utilizing multiple energy sources, alternative fuel vehicles (AFVs) which utilize non-petroleum fuels, electric vehicles powered by advanced batteries, and vehicles powered by fuel cells.
- The Office of Heavy Vehicle Technologies focuses its research on improving the energy efficiency of advanced diesel engines while reducing exhaust emissions from those vehicles, and on developing alternative-fuel diesel engines.
- The Office of Fuels Development sponsors research, development, and demonstration projects focused on developing transportation fuels from biomass, including energy crops, and on conversion systems for producing ethanol from agricultural and forest residues.
- The Office of Technology Utilization encourages the deployment of AFV fleets; supports the establishment of an AFV fuel and service infrastructure; and maintains

the AFV Hotline to answer questions and raise public awareness of the benefits of using alternative fuel vehicles.

### Office of Advanced Automotive Technologies (OAAT)

One of the highest priorities of the program is to improve fuel economy and increase the use of alternative fuels in the transportation sector. Through its involvement in the Partnership for a New Generation of Vehicles (PNGV), OAAT has established the goal of developing technologies that will enable midsize passenger vehicles to achieve a gas mileage of up to 80 mpg by 2004 without sacrificing safety, performance, and affordability. Initiated in 1993, this partnership between the federal government and the automotive industry has as its goal the development of highly fuel efficient preproduction models by Ford, General Motors, and Daimler-Chrysler. OAAT's role in the PNGV program is most prominent in the development and validation of advanced technologies that would require research that, due to the substantial risk involved, might not be conducted independently by industry. Some of the technologies being researched under the partnership include:

- Advanced battery technologies
- Hybrid electric vehicles
- Fuel cells
- Improved heat engine technologies
- Advanced lightweight materials

### Office of Heavy Vehicle Technologies (OHVT)

The Office of Heavy Vehicle Technologies addresses the needs of the manufacturers, suppliers, and users of heavy vehicles. Its mission is to conduct, in collaboration with its heavy vehicle industry partners and their suppliers, a customer-focused national program for research and development (R&D) on critical technologies that will enable the U.S. heavy vehicle transport industry to fully exploit the energy efficiency and alternative fuels capability of the diesel engine while simultaneously reducing highway vehicle emissions. Heavy vehicle industry customers include truck and bus manufacturers, diesel engine manufacturers,

*Energy Efficiency and Renewable Energy's Office of Transportation Technologies (OTT) within the U.S. Department of Energy is charged with reducing America's dependence on petroleum, thereby bolstering the nation's energy security and improving the quality of its air. To meet that goal, OTT enters diverse, cost-shared R&D partnerships with like-minded organizations both public and private, helping develop technologies to a point where industry can commercialize them into marketable products. OTT is organized into four "sub" offices corresponding to major customer areas:*

*The Office of Advanced Automotive Technologies develops technologies that will lead to motor vehicles with greater fuel economy and lower emissions.*

*The Office of Heavy Vehicle Technologies focuses on improving the efficiency of diesel engines for trucks, while simultaneously reducing emissions.*

*The Office of Fuels Development is primarily working to reduce the cost of cleaner, domestically-sourced ethanol, a renewable and easy-to-use alternative fuel.*

*The Office of Technology Utilization is working to pave the way for market acceptance of new transportation technologies through educational, voluntary, and other practical efforts in partnership with industry stakeholders, local, and state government.*

fuel producers, suppliers to these industries, the trucking industry, and other truck users. Besides on-highway transport, other modes of transportation, such as rail, inland marine, and off-road applications rely primarily on diesel engines for power, and all are either facing or expecting to face new exhaust emissions regulations.

Research and development areas include:

- engine technologies,
- vehicle systems technologies, and
- fuels and lubrication technologies.

Key enabling technologies and scientific research areas include emission controls (including exhaust aftertreatment), combustion technology, materials, environmental science and health effects, truck safety, and engineering simulations and modeling.

#### **Office of Fuels Development (OFD)**

Significant opportunities exist in the U.S. to replace great amounts of imported oil with ethanol, a clean-burning fuel which can be made from domestically grown crops and crop residues. The availability of abundant agricultural residues is allowing OFD and its industrial partners to focus on this category of biomass as a feedstock for alternative fuels in the near and mid term. OFD's efforts include developing biochemical processes that will allow the cost-effective conversion of these biomass resources to fuel ethanol. The development of a cost-effective renewable "biodiesel" fuel for use in heavy vehicles is also of interest to OFD. In addition, OFD's Regional Biomass Energy Program (RBEP) works closely with state energy offices and other local partners through its five regional offices within the continental United States. The RBEP facilitates local biomass-based partnerships, coordinates educational workshops, disseminates biomass-related information, and promotes biomass production and use for transportation purposes.

#### **Office of Technology Utilization (OTU)**

The Office of Technology Utilization is dedicated to encouraging the use and deployment of

alternative fuel vehicles in appropriate areas of the U.S. transportation sector. In partnership with industry, OTU provides the catalyst needed to establish public understanding and acceptance of alternative fuel technologies and vehicles. This includes budgeting, managing, and planning for the introduction of these vehicles into the Federal fleet, in accordance with the provisions of the Energy Policy Act of 1992. Clean Cities is OTT's flagship program to promote voluntary public/private partnerships to accelerate acceptance and use of AFVs.

OTU continually:

- Forges partnerships, primarily through its Clean Cities Program, with fleet owners, fuel providers, vehicle manufacturers, and state and local governments to expand the use of AFVs and the development of a refueling infrastructure;
- Provides current, accurate, and reliable information on all types of alternative fuels and vehicles through its Alternative Fuels Data Center and Fleet Buyer's Guide;
- Performs rigorous testing and evaluation of AFVs and other advanced technology vehicles;
- Publishes the Fuel Economy Guide in hard copy and on the Internet, and promotes consumer acceptance of advanced technology vehicles.

To learn more about the DOE Office of Transportation Technologies, visit our Web site at <http://www.ott.gov>.

The Alternative Fuels Data Center Web site can be found at <http://www.afdc.doe.gov>. For Web site information about DOE's Clean Cities Program, visit <http://www.cities.doe.gov>. For more information on the Partnership for a New Generation of Vehicles, visit their Web site at <http://www.ta.doc.gov/pngv>.

**For more information on how DOE is helping America remain competitive in the 21<sup>st</sup> century, please contact:**

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